SUMMARY
OF TECHNICAL REVIEW
OF
EXPRESSION OF INTEREST

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NOTE

SUMMARY OF TECHNICAL REVIEW OF EXPRESSIONS OF INTEREST

The subject of this report is to summarize the Technical Review of Expressions of Interest which reviewed and screened the Expressions of Interest (EOIs) received by SWISC from respondents on the development of a comprehensive long-term waste management system for the Greater Toronto Area.

This summary report is being released by the Solid Waste Interim Steering Committee (SWISC) to the public and member Regional Councils in order to facilitate input to the SWISC planning process. The goal of SWISC is to develop a long-term waste management system for the Greater Toronto Area (GTA), to be in place by 1996, which is environmentally, socially, economically and technically sound.

This summary report has been prepared under the direction of the Technical Committee to SWISC. SWISC will make its final recommendations on the conclusions of this report only after it has received input from the public and Member Councils.

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TABLE 1

SWISC PRINCIPLES

DIVERSION

To aim at fulfilling provincial targets for diversion of solid wastes from disposal (25% by 1992 and 50% by 2000). Disposal of residual waste refers to landfill, energy from waste and other environmentally acceptable methods.

PROVEN TECHNOLOGY

To develop a system based on proven technology for processing solid wastes to eliminate objectionable characteristics associated with some traditional waste management systems and to meet the requirements for approval under the Environmental Assessment Act, the Environmental Protection Act and other pertinent statutes.

INNOVATION

To construct an innovative framework for new research and development in the area of solid waste reduction, re-use and recycling and recovery.

RECEPTIVE COMMUNITIES

To locate facilities, if possible, in receptive communities and maximize industrial development opportunities for those communities.

COLLABORATION

To create a waste management structure that will allow maximum collaborative efforts between municipal, regional, provincial and federal authorities, which best combines the efforts of the public and private sectors, and which best serves as a world-class model for environmentally sound waste management systems.

COST EFFECTIVENESS

To provide a cost-effective solution to the problem of solid waste management while reducing environmental degradation and the real costs associated with conventional waste management systems.

1.0 INTRODUCTION

1.1 Background

This report summarizes the technical review of the 86 Expressions of Interest (EOI) received through the first stage of the public tendering process for the development of a long-term waste management system in the Greater Toronto Area (GTA).

Following an assessment of the range of options proposed in the EOIs, the Technical Review of Expressions of Interest report discusses a variety of potential approaches for developing the long-term system.

The receipt and evaluation of the Expressions of Interest have formed an important element in the comprehensive effort to explore opportunities for regional collaboration on waste management.

The collaborative direction was adopted in March, 1989, when the Chairmen of the five regional municipalities in the Greater Toronto Area (Durham, Halton, Peel, York, and Metropolitan Toronto) in cooperation with the Province of Ontario, issued a document entitled, *The Chairmen's Proposal*. In this proposal, the Chairmen offered to combine efforts in order to seek innovative solutions to the growing problem of solid waste management in the Greater Toronto Area.

To guide the planning process, the Solid Waste Interim Steering Committee (SWISC), in consultation with members of the public, developed six principles (see Table 1) on which to base decision-making criteria.

Since the Chairmen's Proposal, efforts have proceeded on a number of fronts toward realizing the goal of the long-term system; among them, the establishment of SWISC and the Technical Committee, the launch of a public consultation program, the issuance of Requests for Expressions for the Development of a Comprehensive Long-term Solid Waste Management System for the Greater Toronto Area, a 3Rs action plan, and a discussion paper on potential organizational options for a GTA-wide solid waste management agency.

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A complete description of activities undertaken by SWISC are outlined in Status Report #1 (August, 1989) and Status Report #2 (April, 1990).

1.2 The two-stage approach

The SWISC selection process for the preferred system and components must meet the requirements of the *Environmental Assessment Act* (EAA). The EAA requires that a reasonable range of alternatives be identified for evaluation. This should be based on a clearly defined and logical screening process of available options. Once the reasonable set of alternatives has been selected (both alternatives to the undertaking and alternative methods of carrying out the undertaking), each alternative must be evaluated in a systematic and traceable manner based on a net effect analysis and advantages/disadvantage assessment. This evaluation process results in the selection of the preferred system and system components for waste management.

A system is defined as that which addresses all aspects or components of waste management, from the initial supplementation of existing diversion programs to the final disposal of the remaining waste. The components include facilities and operations for the handling and processing of waste such as truck or rail transportation systems, materials recovery facilities, energy from waste plants and landfills.

To meet these requirements, SWISC designed an innovative approach to planning which involved the reliance on a two stage process to provide the basis for detailed analysis of alternatives.

The first stage, which is the Request for Expressions Of Interest (REOI), is documented in this report. It was designed to identify and evaluate all reasonable functionally different alternatives (alternatives to the undertaking) and to select preferred waste management systems which would meet SWISCs principles. The second stage is the Request for Proposals (RFPs), which was designed to select the preferred system and components (alternative methods of carrying out the undertaking).

The REOI was widely advertised in Canada and internationally as an open call for written submissions on effective and innovative solutions to the GTA's problems with solid waste management. Respondents were asked to provide sufficient detail to allow proper evaluation of the proposed technology for a system or component.

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Following evaluation of the Expressions of Interest, Requests for Proposals were to be issued for those systems, or components, that met SWISC criteria.

1.3 Expressions of Interest

SWISC received 86 Expressions of Interest by the deadline of December 28, 1989.

The level of detail provided by each EOI varied from a general statement of interest to relatively comprehensive descriptions of a long-term system. In general, most EOIs did not include sufficient detail to allow a net effects analysis and advantages/disadvantages comparison for the selection of preferred systems.

The EOIs do, however, successfully provide information which has enabled SWISC to identify the capabilities and technologies for waste recovery and disposal components available for long-term waste management alternatives.

This report proposes how to proceed with the next stage, the issuance of RFPs which would lead to the development of a long-term system by 1996.

1.4 Overview of Report

The evaluation is intended to investigate and analyze the environmental and technical characteristics and merits of the systems, or components of systems, based on the information provided in the EOI responses.

Flowing from the EOI analysis, the report outlines a strategy (Section 4) that could be adopted in approaching the RFP stage and sets out a revised approach (Section 5) to pursue the process of implementing a long-term waste management system by the deadline date of 1996.

After input has been received from the public, Government review agencies and SWISC member Councils in May and June, 1990, on the Expressions of Interest, and the issues identified in Section 5 have been resolved, the Requests for Proposals would be issued to potential proponents in September/October 1990.

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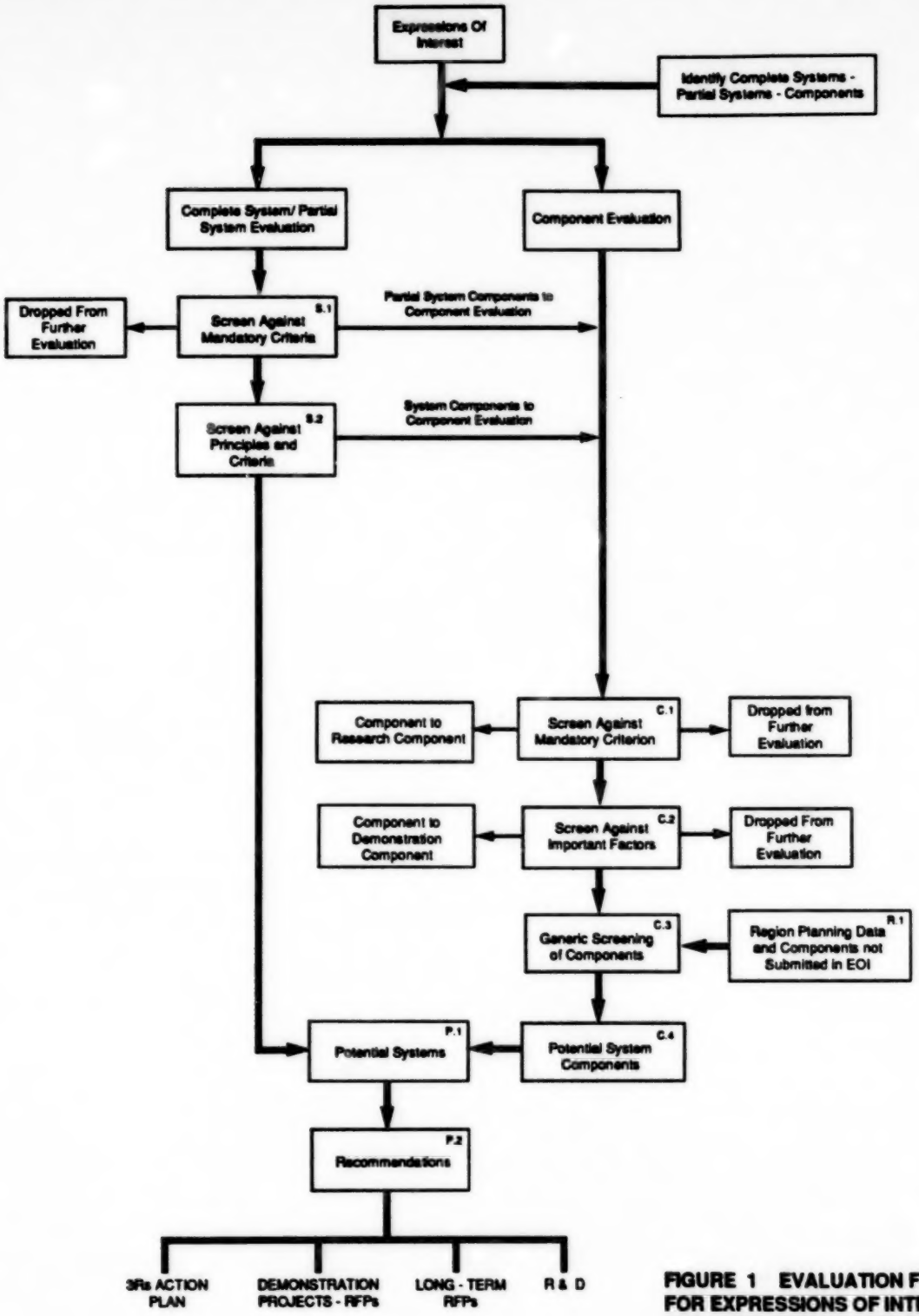

FIGURE 1 EVALUATION FRAMEWORK FOR EXPRESSIONS OF INTEREST - GTA LONG-TERM WASTE MANAGEMENT SYSTEM

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2.0 EVALUATION PROCEDURE

This section summarizes the procedure used in the evaluation of the EOIs.

2.1 A Broad Range of Waste Management Technologies (Options) was Identified

To ensure that all potential waste management technologies were considered, SWISC examined not only the 86 EOIs submitted, but also the waste management planning efforts of the five member Regions, the input from the Technical Committee and the 3Rs Action Plan. This review confirmed that the EOI process had indeed identified all available waste management options.

2.2 The Systems Were Screened in Whole and Then by Component (see Fig. 1)

The 86 EOIs were classified into those which proposed complete systems, partial systems and various components of a system. Those EOIs which proposed complete systems, or which appeared to offer the basic elements of a complete system, were then screened to determine whether they indeed had the potential to offer a complete or partial system. The system screening procedure (S.1) compared the responses against the following mandatory criteria:

Step S.1-1 Achieve 50% diversion of waste

Initially, compliance with this criterion was based upon the respondent's own claim; this claim was then confirmed or disallowed through an examination of each component of the system.

Those systems or partial systems which did not claim to meet the diversion criterion were referred to the component evaluation process.

Step S.1-2 Proven success of system at a scale suitable for the GTA

The responses were also screened to determine whether there were existing operations similar to those being proposed in the EOIs which: 1) were proven to be successfully operating; and 2) could be scaled up for use in the GTA as proposed by the Respondent. Each component was then addressed in more detail in the component evaluation.

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If the EOI did not indicate compliance with this criterion, the system or partial system was referred to the component evaluation or dropped from further evaluation.

2.3 All Technologies Were Grouped Into Components and Then Screened

Following the assessment of complete systems, as described in Step S.1-2 above, individual components were also evaluated against the mandatory criterion (Step C1) which is proven success of component at the scale proposed for the GTA. Components which passed this mandatory criterion were then grouped on the basis of common features and screened against three important factors (Step C.2) and against common and specific criteria (Step C.3). Following this, the most suitable components and, where possible, the preferred technologies were identified (Step C.4). These components, combined with the complete system options formed the basis for development of the basic potential systems (Step P.1). These procedures are detailed below and described in full in the technical review report.

In the evaluation of components, information on the Regions' waste management planning efforts was reviewed to ensure that all ideas had been included. The components were classified as identified in Table 2.

Potential system components were evaluated in the following manner:

Step C.1-1 Proven success of operation at a scale suitable for the GTA

In this step, each component was examined to determine the scale and success of the existing facilities referenced by the Respondents. These were then compared to the facilities as proposed by the Respondent to determine if they would be suitable for immediate implementation.

If the response failed to meet the mandatory criterion and did not show promise when compared to the remaining criteria discussed in steps C.2 and C.3 it was dropped from further evaluation.

If the response failed to meet the mandatory criterion, yet appeared to have potential when compared to the remaining criteria, it was recommended for further evaluation at the RFP stage for demonstration or R&D facilities. These stages are designed to identify also if the component can be used at a smaller scale than proposed.

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If the response met the mandatory criterion or appeared close to meeting it, it was evaluated further in Step C.2.

Step C.2 Important factors

The components of those EOIs carried forward from Step C.1-1 were then grouped on the basis of common features and screened against three important factors:

- Demonstrated ability to meet environmental requirements.
- Flexibility of the components to incorporate future developments.
- Operation by 1996 at the latest.

If the response failed to meet or show promise of meeting the three important factors it was dropped from further evaluation.

If the response failed to satisfy the factors, yet appeared to have long-term potential, it was recommended for further evaluation at the RFP stage for R&D facilities.

If the response appeared to satisfy the factors, it was evaluated further in Step C.3.

Step C.3 Common and specific criteria

Each component was screened against the common and specific criteria described in the main report which are related to environmental, technical and planning issues and assessed in a similar manner as Step C.2 above.

Step C.4 Potential system components

From this evaluation, the most suitable components and, where possible, the preferred technologies were identified for consideration as system options in Step P.1.

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Step P.1 Potential systems

From those systems identified in Steps S.1 and S.2 and components identified in Step C.4 above, basic alternative long-term system options were developed.

2.5 EOI Options Were Screened into Five Categories for Further Action

As noted above, the success of the original planning approach relied heavily on the information in the EOIs received by SWISC. As the EOIs were analysed, it was apparent that while they represented a successful identification of options, they did not provide enough detail for a substantive determination of the preferred system(s) or preferred components. In some cases, the EOI also lacked detail which would allow the system or component to be evaluated further beyond the first step.

It was possible however, to screen the available options into five categories, based on the degree to which the criteria had been met:

- Unacceptable Options

  If the proposed options did not meet the mandatory criteria and did not show promise when compared to the remaining criteria or did not contain sufficient information, it was dropped from further evaluation.

- Acceptable Options

  If all the criteria were met to a reasonable degree, the option was considered to represent an alternative which could be implemented immediately or further evaluated at the full scale RFP stage. This would be done using a net effects analysis and advantages/disadvantages assessment.

- Potential Options

  If the option reasonably met all the criteria, but lacked the proven ability to scale up as proposed by the EOIs, it was considered to be an alternative requiring

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further testing and was placed in the demonstration category. The technology would be part of a demonstration program designed to identify and resolve any problems which might arise through scaling-up the facility. Once any problems had been addressed, the technology would be ready for a net effects analysis and advantages/disadvantages assessment.

- Research and Development

  If the technology was considered to have potential, but required further research for its full development, it was placed in the research and development category.

- 3Rs Action Plan

  If the option, or idea, submitted was considered to have potential to assist SWISC in the short-term, it was referred to the 3Rs Action Plan for further consideration.

The results of this screening are described in Section 4. Section 5 describes the steps proposed to continue the development of the long-term waste management system. Those EOIs which would be requested to respond to RFPs would be selected after the additional steps described in Section 5 have been addressed.

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3.0 SYSTEM AND COMPONENT ANALYSIS

Following the initial screening of EOIs to identify systems and the various components, both were analysed in more detail and evaluated in accordance with the procedure. Please refer to Table 2 for a summary of the EOIs which are generally referred to herein by number. This table also provides the reference to the Section in the Technical Review of EOIs which describes the analyses of each component. Table 2 also notes whether the component would be considered further in the 3Rs Action Plan or would be eligible for RFPs for full scale facilities, demonstration facilities, or R and D. These EOIs which would be requested to submit proposals under these components would be selected after the additional steps described in Section 5 have been addressed.

3.1 System Alternatives

Complete Systems

Six EOIs of the 16 EOI system responses received, appeared to offer all of the components identified in the REOI. This included the initial supplementation of the existing area municipalities diversion programs to the final disposal of the remaining waste, all of which are necessary to provide a complete long-term waste management system.

These EOIs included: #48 - Equity Waste Management
#50 - Alternative Environment
#51 - WMI Waste Management of Canada/Wheelabrator Evaluation
#53 - Ontario Northland Transportation Commission
#67 - Laidlaw Waste System
#73 - Surety Environmental Inc.

These six were subjected to the S1 (50% diversion) and S2 (proven success) screening process described earlier.

#50 - Alternative Environment, and #73 - Surety Environmental, did not satisfy the 50% diversion criteria and were therefore referred for further consideration in the component evaluation screening.

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TABLE 2

SUMMARY OF EOI CATEGORIES

		4.0 SYSTEMS		COMPONENTS													
					Processing		6.0 Disposal Facilities							7.0 Other			
Co. No.	Company Name	4.1 Complete System	4.2 Partial System	5.3 Additions to Region	5.4 Mech. Recov.	5.5 Com-post	6.1 RDF	6.2 EFW	6.3 Wet Oxid.	6.4 Vol. Red.	6.5 Pyrol	6.6 Landfill Land	6.6 Landfill Ops.	7.1 Trans	7.2 R&D Proj.	7.2 Conc. Ideas	7.5 Cons. Serv.
1	Lamarche McG				D	D							F				
2	Westinghouse			3Rs	D			F									
3	Adv. Ecology			3Rs	D	D											
4	Dynavest Int.		O		D		R				R						
5	St. Lawrence			3Rs	D		F						F				
6	Buhler-Ming			3Rs	D	D	F								R		
7	Cogenesis		O		D	D	F				R					R	
8	Lavalin														R		O
9	Foster Wheeler		O	3Rs	D	D		F						D			
10	NSP Invest.											F					
11	Proctor Gamble			3Rs		D									R		
12	Desautels & D.			3Rs	D												
13	Dynaforce W.R.			3Rs						R							
14	MacLaren Eng.																O

O = See component evaluation, 3Rs = Submitted to 3Rs F = Full RFP, D = Demonstration RFP, R = Research RFP

U = Unacceptable option, U* = Insufficient Information to Evaluate

Note: EOIs indicated as F,D or R will be subject to additional screening and public input prior to being asked to submit a proposal.

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15	Expocrete Ltd			3Rs	D	D											
16	Armbro Mat'ls			3Rs									F				
17	Waste Dist.			3Rs	D						R						
18	WPF Corp. BLI				D	D											
19	Kenox Corp				D				R								
20	See-Beh W E T		O					U*						R	U*	U*	
21	Round-Up W P			3Rs		D								D			
22	Nora Bioenergy			3Rs	D	D										R	
23	Swedish Trade			3Rs													O
24	Env. Disposal			3Rs	D		R										
25	Kilborn Ltd.			3Rs	D	D	F										
26	Igloo Recyc.			3Rs	D									D			
27	Airite Env.			3Rs		D											
28	Super'r-Crawf.											F					

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29	Encomp Ltd.				D	D											
30	Compost Man.			3Rs		D											
31	Reuter		O	3Rs	D	D	F							D			
32	Recomp Inc.			3Rs	D	D											
33	TransCan Pipe			3Rs											R		
34	Notre Devel.			3Rs	D	D							F		R		
35	Enviromax		O	3Rs	U*			U*					F				
36	808106 Ont				D			F									
37	Wood Waste			3Rs	D												
38	Redipac Recyc.			3Rs	D	D									R		
39	SNC Inc.			3Rs													O
40	Crang & Boake			3Rs				F									
41	I-S-E Sales			3Rs													
42	Browning F.I.		O	3Rs	D								F				O

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43	Stinnes Enerco			3Rs				F									
44	Trican Energy			3Rs	D	D											
45	Wastestreams			3Rs	D											R	
46	Agra Indus.			3Rs	D											R	
47	Nelson Agg.												F				
48	Equity Waste	O		3Rs	D	D							F	F	R	R	
49	Steetly Quarry												F				
50	Alternative	O		3Rs	D					R						R	
51	WMI Waste	O		3Rs	D	D	F	F					F		R		
52	ONTC see #53																
53	ONTC	O		O	D	D	F	F					F	F			
54	ONTC see #53																
55	Dual Environ.			3Rs	D									D			
56	Chanson Pall.			3Rs	D												

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57	Trow + D & M			3Rs													O
58	Weldex Co.				D	D	F	F							R		
59	Agripost			3Rs		D											
60	Enviro-Watch			3Rs										D			
61	CN Rail			3Rs	D									F			
62	CP Rail			3Rs										F			
63	Royaledge			3Rs	D	D	F										
64	Wastech				D						R						
65a	Otto-Canada		O	3Rs	U*	U*		U*					F	U*			
65b	Halton-Otto			3Rs	D												
66	Pattison		O	3Rs	D			R								R	
67	Laidlaw	O		3Rs	D	D	F						F				
68	ICG Co-Gen				D			F									
69	MSW Recyc.			3Rs	D	D											

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70	Faruk Fattah			3Rs		D	R			R			F		R		
71	Env. Air Struc.			3Rs	D	D	F			R						R	
72	Markham/Miller		O	3Rs	D								F	D	R		
73	Sarsty Env.	O		3Rs	D		F	F					F	R			
74	Badminster Bio			3Rs		D									R		
75	ONTC see #53																
76	Muscillo Trans.			3Rs	D	D		F									
77	Monteray Inc.			3Rs	D	D		F							R		
78	Ogden, Martin			3Rs	D			F									
79	Ortech Int.			3Rs											R		
80	Paul Tonolini											F					
81	Methon Energy												R			R	
82	Chivers-Wilson															U	
83	Resntech Corp.			3Rs												R	

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					Processing		6.0 Disposal Facilities							7.0 Other			
Co. No.	Company Name	4.1 Complete System	4.2 Partial System	5.3 Additions to Region	5.4 Mech. Recov.	5.5 Com-post	6.1 RDF	6.2 EFW	6.3 Wet Oxid.	6.4 Vol. Red.	6.5 Pyrol	6.6 Landfill Land	6.6 Landfill Ops.	7.1 Trans	7.2 R&D Proj.	7.2 Conc. Ideas	7.5 Cons. Serv.
84	W.Hutchinson											F					
85	Stone & Webst.			3Rs													O
86	Standard Agg.											F					
	TOTALS	6	10	62	51	33	15	17	1	4	4	5	17	14	15	13	7

O = See component evaluation, 3Rs = Submitted to 3Rs F = Full RFP, D = Demonstration RFP, R = Research RFP

U = Unacceptable option, U* = Insufficient Information to Evaluate

Note: EOIs indicated as F,D or R will be subject to additional screening and public input prior to being asked to submit a proposal.

The remaining systems were then subjected to a more detailed evaluation of their components. The quality of these EOIs demonstrated that there is the capability to handle large portions of the waste stream and respond to EA requirements. Key components including transportation, EFW and landfill were identified which may meet the GTA requirements. However, it was found that each EOI contained components, particularly with respect to achieving the 50% diversion target, which require additional information and analysis. These components should be subjected to additional testing before SWISC could proceed to the RFP stage in anticipation that they would provide an acceptable system.

In the final analysis it was concluded that complete systems should not form the basis for RFPs, but that the components of these EOIs be recommended for further screening in the next stage.

Partial Systems

Ten EOIs proposed significant portions of a complete system. To determine if these partial systems might provide a significant portion of a complete system they were described and evaluated in the S.1 screening process.

Three of the EOIs provided insufficient information and were not evaluated further at this time:

#20 See-Bah
#35 Enviromax
#65(a) Otto-Canada

The remaining seven EOIs provided varying portions of a complete system and were referred to the component evaluation process:

#4 Dynavest International
#7 Cogenesis Corp.
#9 Foster Wheeler
#31 Reuter of Canada Inc.
#42 Browning Ferris Industries
#66 Pattison Information Inc.
#72 Markham Disposal

3.2 Diversion Ideas and Components with Immediate Potential were Referred to the 3Rs Action Plan

Concurrent with the evaluation of the EOIs, SWISC was preparing a 3Rs Action Plan to:

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- Inventory current 3Rs initiatives
- Identify opportunities for collaboration within the GTA; and
- Develop an Action Plan for improving the effectiveness of 3Rs efforts within the GTA immediately and throughout the implementation of the long-term waste management system.

As many of the EOIs contained ideas or components which warranted consideration in the Action Plan, the information was extracted and provided to the 3Rs task force.

Ideas

As noted on Table 2, 62 EOIs provided ideas with respect to actions which could assist in meeting the 3Rs objectives. These are documented in the report under the headings:

- Reduction at Source
- Material bans from landfill
- Demonstration Programs
- Continue Class 1 Blue Box Programs
- Blue Box Program Unnecessary
- Commercial/Industrial Programs
- Full Wet/Dry Collection for Compacting
- Household Organics Collection for Composting
- Transportation and Collection Enhancements
- Hazardous Wastes
- Waste Exchanges
- Mandatory Recycling
- Research Programs
- Management Services
- Expand Blue Box for Collection
- Office Paper Recovery Programs
- Construction/Demolition Programs
- Garden and Leaf Collection for Composting
- Commercial Organics Collection for Composting
- Depots and Drop-Off Centres
- Other Materials

Components with immediate potential to assist 3Rs.

As well as being considered as material recovery facilities for the long-term system, EOIs were identified as warranting consideration for immediate implementation to process specific materials, namely:

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- Wood
  - EOI #37 Wood Waste Solutions and
    EOI #56 Chasson Pellets Ltd.

- Drywall
  - EOI #12 Noel Desautels and Paul Detering

- Construction/Demolition
  - EOI #15 Expocrete Ltd.
  - EOI #42 Browning Ferris Industries Ltd.
  - EOI #45 Waste Streams Systems Ltd.
  - EOI #55 Dual Environmental Systems
  - EOI #72 Markham Disposal

- Food Waste
  - EOI #38 Redipac Recycling Inc.

- Mixed Plastics
  - EOI #38 Redipac Recycling
  - EOI #58 Weldex Company

- Tires
  - EOI #7 Cogenesis Corp.
  - EOI #25 Kilborn Ltd.
  - EOI #58 Weldex Company
  - EOI #67 Laidlaw Waste Systems.

Several EOIs stressed the importance of the removal of Hazardous Wastes from the waste streams. This is becoming more critical with increased sophistication of the waste management components and is considered an essential element to proceed with in the 3Rs action plan.

3.3 Two Basic Approaches to Achieve 50% Diversion

The EOIs presented two basic approaches to achieving the provincial 50% diversion target by the year 2000:

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- enhancing the present Blue Box collection system and adding associated material recovery and composting facilities; or

- utilizing a Wet/Dry collection system and adding associated material recovery and composting facilities

The advantages and disadvantages of these two systems were compared. In order that every effort be made to maximize diversion, it was concluded that both systems should be recommended for further screening in the RFP stage as described below.

As part of these basic approaches the EOIs presented a variety of material recovery facilities (MRFs) the majority of which also include composting as part of the recovery process.

These were analysed in the following groupings:

- **MRFs as integral parts of Disposal or Composting Facilities.** Fifteen EOIs (#2, #4 #5, #17, #18, #19, #24, #35, #50, #64, #66, #68, #69, #73 and #76) included means to recover a small percentage of materials prior to EFW or composting. As these proposals did not provide a significant, separate materials recovery element, they were evaluated as part of the disposal component only.

- **MRFs which were proposed as major diversion components** were subdivided into the following groups:

  Group 1(a) - MRFs which accept mixed wastes from the Wet/Dry Collection System. Three EOIs (#51, #65a and #71) proposed facilities which divert from 43 to 65% of the total waste stream by varying proportions of diversion and composting based on European recovery processes.

  Confirmation of the actual diversion percentages claimed or the marketability of recovered materials is required. However, the potential exists for these facilities to achieve the 50% diversion target, therefore, it was concluded that Wet/Dry MRFs be recommended for further screening at the RFP stage for demonstration plants.

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Group 1(b) - MRFs which accept wastes remaining after the Blue Box materials have been removed. Eighteen EOIs (#1, #3, #6, #22, #25, #29, #31, #32, #34, #36, #46, #48, #53, #58, #61, #63, #67 and #72) submitted a variety of technologies of which the Buhler, Brini, Lundell, (modified) Mitsui and Sorain Cecchini processes appeared to be most advanced towards meeting SWISC requirements. Diversion varied from 18 to 85% of portions of the total waste stream. These processes are recommended for further screening at the RFP stage for demonstration plants.

Group 1(c) - Two MRFs (#7 and #44) take total mixed wastes without any source separation. The concept of elimination of source separation of wastes was deemed to be contrary to the basic policy of reduction and separation at source adopted by Ontario. The EOIs in this group were not considered further in the evaluation. Referenced plants would be monitored for their potential suitability for processing waste after source separation.

Group 2 - Seven MRFs (#9, #26, #42, #65b, #72, #77 and #78) take portions of the waste stream separated at source. Five EOIs (#9, #26, #72, #77 and #78) would recover material from both residential and commercial/ industrial sources, #42 and #65b processed only commercial/ industrial. Construction and demolition MRFs (see Group 3) were also proposed by #42 and #72. Technologies included Resource Recovery, Igloo, Halton-Otto, RSTI, Bezner and Montenay-Atlantic. Three EOIs processed only commingled source separated, material.

These EOIs will be considered in the 3Rs Action Plan for any means of improving the capacity and efficiency of the existing systems.

Group 3 - This group of MRFs includes those which process specific materials only such as drywall, wood, construction/demolition, mixed plastics and tires.

The thirteen EOIs (#7, #12, #15, #25, #37, #38, #42, #45, #55, #56, #58, #67 and #72) were received and forwarded to the 3Rs Task Force and the Regions as

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previously noted for immediate consideration. Many are considered important components of the long-term system.

Thirty-three EOIs proposed composting as an important component in achieving the 50% diversion targets.

Twenty EOIs (#1, #3, #6, #7, #18, #22, #25, #29, #31, #32, #34, #38, #44, #48, #53/75, #58, #63, #67 #69, and #71) proposed composting as an extension of MRF processing. Another twelve EOIs (#9, #11, #15, #21, #27, #30, #51, #59, #65a, #70, #74 and #77) would compost the source separated organic fraction of the waste streams. EOI #76 provided no details. Of these proposals, the windrow, aerated static pile, in-vessel and combined in-vessel/windrow methods for different types of waste material such as yard wastes, separated organics, and organics from MRFs, are recommended for further screening at the RFP stage for demonstration plants to confirm that they can produce a marketable compost.

Two EOIs (#38 and #48) proposed vermicomposting, which is the production of compost by the digestion of waste carried out by worms. This composting method is recommended for further screening at the RFP stage for R&D plants.

3.4 Disposal by Energy From Waste and/or Landfill

These EOIs contained a comprehensive and innovative range of technologies for the disposal of the wastes remaining after diversion. They were evaluated under the following groupings:

- Refuse Derived Fuel (RDF)
- Energy from Waste (EFW)
- Wet Oxidation
- Volume Reduction
- Pyrolysis
- Landfill

Fifteen respondents (#4, #5, #6, #7, #24, #25, #31, #51, #53, #58, #63, #67, #70, #71 and #73) proposed some form of RDF technology generally as a product from a mechanized processing facility. The majority described the production of RDF for conventional EFW plants. The

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production of raw coarse (cRDF), fluff (fRDF) and densified (dRDF) were considered as proven technology at the scale proposed for the GTA with the flexibility to incorporate future developments in waste management. The EOIs were reviewed with respect to the technologies and experience submitted. Subject to confirmation, a short list of eligible respondents will be prepared at the RFP stage for full scale plants.

Seventeen respondents (#2, #9, #20, #35, #36, #40, #43, #51, #53, #58, #65a, #66, #68, #73, #75, #77 and #78) included EFW components in their submissions (#43 and #53) are related and propose the same EFW plant. EFW is considered proven technology. The EOIs were reviewed with respect to the technologies and reference submitted. Subject to confirmation, a short list of eligible respondents will be prepared at the RFP stage for full scale plants.

Two respondents #66 and #20 proposed the conversion of ash to ceramic pellet form and are recommended for further screening at the RFP stage for R&D projects and for further consideration with respect to the degree of flexibility of the EFW components considered at the RFP stage.

One respondent #19 submitted a proposal using a wet oxidation technology which would treat MSW and sewage sludge. This is not considered a proven technology and is recommended for further screening at the RFP stage for R&D projects.

Four respondents (#13, #50, #70 and #71) proposed volume reduction prior to disposal. #50 also encapsulated the waste in vinyl and concrete to form a block. Although apparently used extensively in Japan for land reclamation and as a building material, more detailed information is required to determine if this would be an acceptable disposal or diversion method in Ontario. The others included methods of shredding and compressing the waste. All are recommended for further screening at the RFP stage for R&D projects.

Four respondents (#4, #7, #17 and #64) offered pyrolitic processes. The processes may produce a marketable char which would significantly reduce the need for landfill. However, despite extensive work over the years to produce commercial scale operations this process is not considered proven and is recommended for further screening at the RFP stage for R&D projects.

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Twenty two respondents (#1, #5, #10, #16, #28, #34, #35, #42 #47, #48, #49, #51, #53, #65a, #67 #70, #72, #73, #80, #81, #84 and #86) offered potential landfill sites. Five (#10, #28, #68, #84 and #86) offered land only and one (#81) a conceptual lakefill design.

The majority of landfill operations proposed include some form of on-site materials recovery or processing facilities. Thirty-four sites were referenced. Fourteen separate sites were specifically identified by location while the remaining sites were only referred to in general terms.

The EOI responses for landfill were examined with respect to:

- Location
- Distance and transportation mode from GTA
- Identification of landfill operation or land only
- Host community status
- Site studies or government approvals
- Previous discussions with regions
- Potential capacity
- Area of land offered
- Potential life of the facility
- Existing landuse
- Extent of studies carried out to date by each

Site capacities varied from 3.4 million tonnes (EOI #67) up to 70 million tonnes (claimed by EOI #70). Five proponents, (EOIs #5, #16, #34, #47 and #49) all of which included gravel, quarry or mining operations, identified capacities in the order of 20 to 25 million tonnes.

Distances to the sites varied from over 1650 km (Ignace #48, Maritimes #73) to several other Northern Ontario locations within 500 km. The majority were located within 150 km of downtown Toronto or within the GTA itself.

Only one respondent (EOI #38) supplied information indicating community support for the facility (Adams Mine in Kirkland Lake). Several indicated ongoing negotiations which could not be publicized at this time. Several others indicated that opposition was present either from local groups, the local municipality or both. Expressions of opposition have been received by SWISC information office for several sites.

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The level of studies and government approvals was varied. Seven respondents (EOIs #5, #16, #28, #34, #35, #47 and #53) reported some preliminary site investigations, while 3 respondents (EOIs #1, #49 and #67) had produced preliminary Environmental Assessment documentation which they are in the process of submitting to the Regulatory Authorities. EOI #10 was involved in a previous 1988 EA hearing.

EOIs #65a, #73 and #80 did not provide information that would permit evaluation. EOI #81 is a conceptual design for lakefilling of MSW which current Ministry guidelines prohibit. However this is referred to R&D for further review.

Landfilling is a proven component and necessary to any waste management system. Before issuing RFPs it is recommended that further information be obtained from the respondents with respect to the status of receptive communities and available site information as summarized in the following section. This information along with a more finalized site selection framework, would be used to select those respondents who would be asked to submit RFPs and to determine screening criteria for the evaluation of the RFPs.

3.5 Facility Siting

Those respondents identifying specific sites were documented. Sixteen (#1, #12, #15, #16, #31, #34, #35, #43, #47, #48, #49, #53, #54, #67, #73 and #84) are outside the GTA and ten (#5, #10, #17, #27, #28, #56, #67, #69, #72, #73 and #77) are within the GTA.

In many EOIs, facilities were proposed to be located at existing landfill sites, transfer stations or industrial lands owned by the Regions. The Regions have indicated that, in fact, little space is available in such locations for these facilities and alternative sites will have to be found.

Only the facilities proposed near Kirkland Lake (EOI #34, #48, #53) for processing and landfill, the Sarnia and Kettle Point Reserve (EOI #31) for processing, near Kapuskasing (EOI #53 and #43) for EFW and Ignace (EOI #48) for processing appear to be acceptable to the local community at this time.

SWISC is conducting a program to identify potential receptive communities. It should be noted that the Region of Halton is willing to be considered as a receptive community for an EFW facility.

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Facility siting should be co-ordinated with SWISCs ongoing site identification program and the additional discussions with the respondents. Siting should be addressed specifically in response to RFPs in order to address SWISCs objective of finding a receptive community.

3.6 Transportation Alternatives include Truck and Rail

All EOIs involved the transportation of wastes by road to varying degrees. This is a necessary and proven method of transportation which provides considerable flexibility to meet environmental requirements.

Rail Transportation

Four EOIs specifically proposed rail haul for wastes to remote locations, namely:

- #52 ONTC
- #61 CN Rail and Bechtel Canada
- #62 Canadian Pacific Rail
- #48 Equity Waste Management of Canada Corporation

The methods proposed to transport the waste and experience in Europe and the U.S., demonstrated that this is proven acceptable transportation alternative. It provides flexibility in widening potential site locations and reduces road traffic concentration and risk.

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Water Transportation

Two EOIs proposed shipping the wastes by water.

- #20 See-Bah Waste Elimination Technologies Ltd. propose shipping wastes to a processing facility in Sault Ste. Marie and bringing back recovered products. Secondary transportation options for rail or truck haul are suggested.
- #73 Surety Environmental Inc. proposes to ship wastes to an EFW facility in the maritimes.

These submissions (#20 and #73) did not clearly address the winter shutdown of Great Lakes shipping. In view of the investment which would be required for alternative transportation during this period, this alternative method of transportation is not considered to be suitable for the GTA.

3.7 Interest was Shown in Undertaking R&D Initiatives

Many respondents stressed the necessity for continuing research in waste management solutions.

Five EOIs (#8, #34, #48, #79 and #72) offered specific locations or information related to the development of R&D centres. Five (#20, #38, #58, #70 and #74) proposed demonstration projects; three EOIs (#11, #33, #77) proposed continuation of existing R&D projects; two EOIs (#6 and #51) expressed monitoring capabilities related to overseas R&D centres; and five EOIs (#1, #34, #48, #50 and #79) proposed that a portion of fees be allocated to R&D.

Ideas which warranted consideration of further R&D were listed from the EOIs. As a result of the findings of this report, R&D capability for SWISC should be developed. In addition to laboratory work it would also include the construction of demonstration projects. The decision on the construction and location of a specific R&D centre should not be made at this time as it may be dependent on the form and location of the long-term waste management system chosen by SWISC. However it could be screened at the RFP stage for R&D.

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3.8 Flexibility with Respect to Ownership and Operation

In order that SWISC may select an appropriate structure to manage the solid waste system in the GTA, the REOI requested that respondents state whether they were willing to submit a Proposal and subsequently contract with the Authority to provide the facilities described in their response with respect to each of four options.

Option 1	-	Full Ownership and Responsibility for operation of the Waste Management System by the Authority
Option 2	-	Shared Ownership and Responsibility for operation of the Waste Management System by the Contractor and Authority
Option 3	-	Authority to lease (with Option to Purchase) the Proposed System from the Contractor
Option 4	-	Full Ownership and Responsibility for Operation of the Waste Management System by the Contractor

Most of the respondents who addressed this issue indicated flexibility with respect to the options, with some exceptions:

- Option 1 only - #13 and #46
- Option 4 only - #32, #37, #49, #66 and #74
- Option 4 and Options - #70
- Option 4 Preferred and Option 2 - #7, #20, #43 and #62
- Option 4 and Option 3 - #68 and #69
- All Options except for control of Transportation Component - #61

The exceptions would be considered in the preparation of RFPs.

3.9 The REOI was not meant to be a request for Consulting Services

Seven EOIs (8, #14, #23, #39, #42, #57 and #85) offered consulting service skills, project management capabilities and even some project financing. It should be stressed, however, that the REOI was not meant as a call for consulting and engineering services. Firms who did not submit EOI responses will still be eligible to supply services to SWISC in the future.
A series of criteria were established to represent these EOIs and suggest at what project stage they could be evaluated on their own merit.

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4.0 EVALUATION FINDINGS

The evaluation of complete systems concluded that complete systems should not form the basis for RFPs, but that their components be evaluated for inclusion in the development of a complete system.

4.1 Our Analysis Indicates Several Potential Methods to Achieve 50% Diversion

The 3Rs hierarchy adopted by SWISC for wastes diversion is; (1) Reduction, (2) Re-use, and (3) Recycling including recovery of materials and compost. The production of RDF and EFW are not included in the diversion goal of 50% by 2000.

Reduction requires concerted efforts by all levels of Government, the Private Sector and the Public. It is common to all systems and is to be maximized. However, the actual percentage of diversion which can be achieved by reduction is unknown at this time.

Separate collection and disposal of Household Hazardous Wastes (HHW) is also common to all approaches and is essential for an environmentally acceptable waste management system. Again the percentage of diversion which can be achieved is unknown.

The 3Rs Action Plan recommends approaches which build on existing efforts to increase diversion as soon as possible. These actions will establish a basis for the percentage diversion which can be achieved and the need for additional or preferred measures.

The EOIs proposed two basic approaches which claimed to exceed the 50% diversion target, namely:

(1) Enhanced Blue Box for collection of source separated materials in a three container system. One container (Blue Box) would contain separated recyclables for pickup and processing. One container would contain separated organics for composting. One container would contain the remaining wastes. A MRF would be used to recover additional materials from this third waste stream.

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Separate collection and composting of yard wastes.

Separation at source of recyclable materials from Commercial/Industrial wastes and MRF facilities to recover additional materials from the remainder.
Diversion of Construction/Demolition Wastes.

(2) Use of a two bin collection system (wet/dry) for materials separated at source into wet wastes and dry materials. These would be processed by MRF.

Separate collection and composting of yard wastes.

Collection and processing of Construction and Demolitiion wastes.

The advantages and disadvantages of these diversion alternatives are presented in the report. Mainly large scale (i.e. in excess of 800 TPD) MRFs and composting facilities were proposed to meet the needs of the GTA. From checks made on the existing facilities provided as reference, it was considered that these facilities were not proven at the scales proposed with respect to GTA conditions and markets. However there are enough promising processes as discussed in Section 3, to warrant an aggressive approach to determining what is most appropriate and at what scale to achieve the 50% diversion target.

In summary, priority should be given to establishing the amount of diversion which various methods can achieve by reduction, re-use and recycling of materials from the separate waste streams. This includes the evaluation of the large scale MRFs proposed in the EOIs for processing MSW in the GTA and consideration of a larger number of smaller facilities. This will form the basis for selecting the preferred methods and the scale most appropriate to serve the respective members of SWISC.

4.2 Our Analysis Proposes Energy From Waste and/or Landfill for Disposal

In t' analysis of the disposal components in the EOIs as summarized in Section 3, the production of energy from waste was considered in two forms, namely:

- Refuse Derived Fuel (RDF) which is the combustible fraction of the waste

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produced from mechanized resource recovery plants and suitable for combustion in dedicated incinerators or used as a supplementary fuel in industrial boilers, kilns, etc. The MRF facilities whose main function is materials recovery and which produce RDF only as a supplement, would be considered after they had been sufficiently proven. However plants designed primarily for production of RDF would be considered proven now for disposal of wastes.

- Energy from Waste (EFW) which is the mass burning of MSW, generally with some limited material preparation, to produce steam and/or electricity.

Both of these components are considered proven technologies, for the production of energy from wastes.

Landfilling is the other proven technology and at this time, represents a common component for any waste management system.

Combinations of energy from waste and/or landfilling will be considered to determine the optimum disposal facilities for the GTA. These facilities would be designed to take 50% of the GTA wastes after year 2000 with flexibility to accommodate less material over a longer period of time should the 50% diversion target be exceeded.

4.3 The Basic System

The basic long-term system will include reduction, re-use, collection with source separation, processing, composting and energy-from-waste and/or landfill disposal components as outlined above.

The reduction, re-use and landfill disposal alternatives are common to all approaches. Other diversion components also contain common elements such as composting of yard wastes and separate organic waste streams, and the collection and processing of construction and demolition wastes. Components for the collection and processing of commercial and industrial wastes could also be common.

However the best way of achieving significant diversion of wastes by these elements has not yet been demonstrated for the GTA. This entails not only proving how much waste may be diverted

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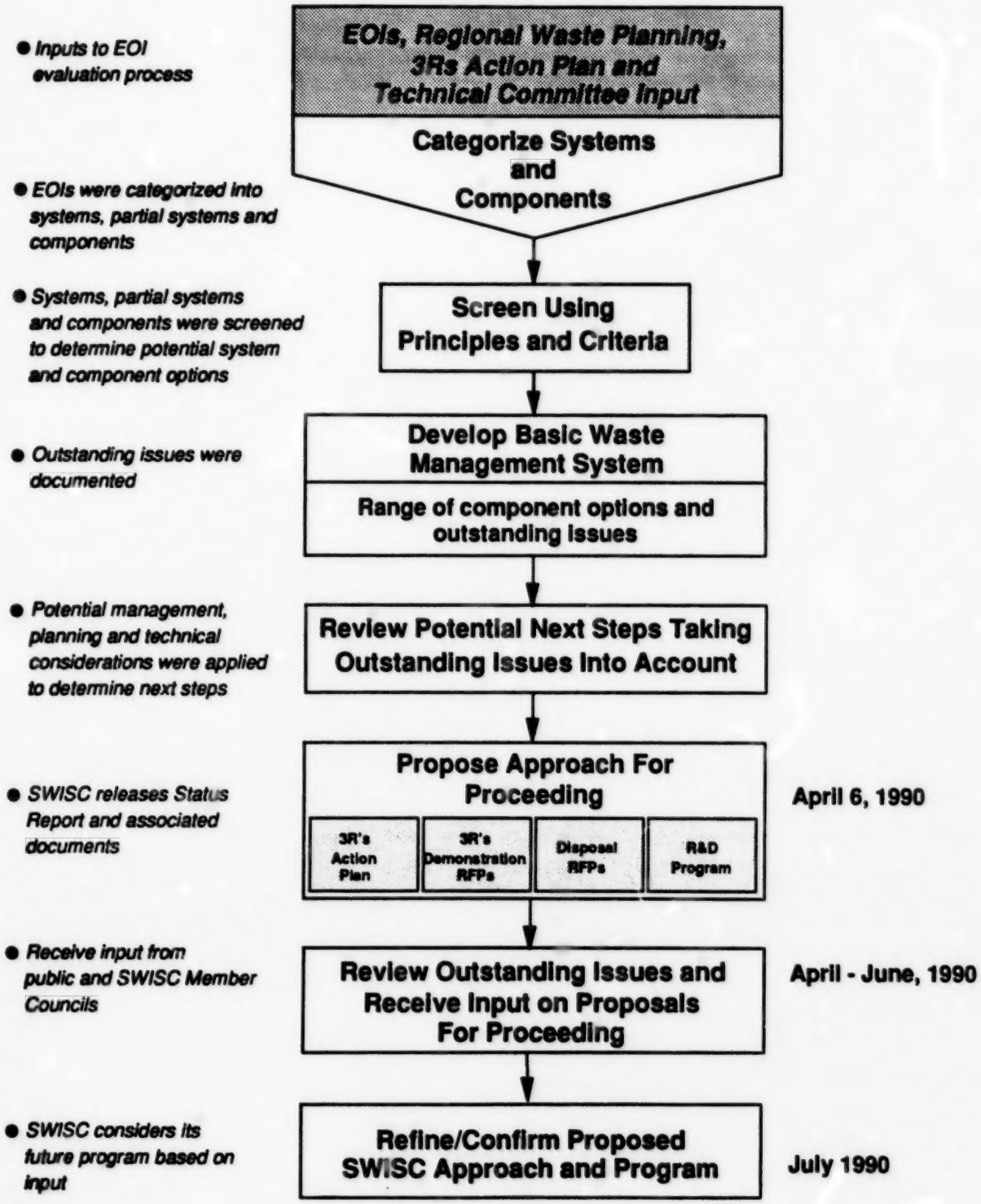
Figure 2

EVALUATION PROCESS AND PROPOSED APPROACH FOR PROCEEDING


• Inputs to EOI evaluation process
EOIs, Regional Waste Planning, 3Rs Action Plan and Technical Committee Input
Categorize Systems and Components
• EOIs were categorized into systems, partial systems and components
• Systems, partial systems and components were screened to determine potential system and component options
Screen Using Principles and Criteria
• Outstanding issues were documented
Develop Basic Waste Management System
Range of component options and outstanding issues
• Potential management, planning and technical considerations were applied to determine next steps
Review Potential Next Steps Taking Outstanding Issues Into Account
• SWISC releases Status Report and associated documents
Propose Approach For Proceeding
3R's Action Plan
3R's Demonstration RFPs
Disposal RFPs
R&D Program
April 6, 1990
• Receive input from public and SWISC Member Councils
Review Outstanding Issues and Receive Input on Proposals For Proceeding
April - June, 1990
• SWISC considers its future program based on input
Refine/Confirm Proposed SWISC Approach and Program
July 1990

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by reduction, re-use and recycling based on further development of the present efforts, but also the technological aspects of MRF and composting facilities to produce products marketable in the quantities relevant to the GTA. The approach to developing this basic system and defining the alternative methods included in it, is described in the following sections.

4.4 Approach to Develop the Long-Term System (see Figure 2)

The weakness in choosing between fundamental means of meeting the critical diversion criterion affects how SWISC proceeds with the next step in establishing a long-term waste management system. SWISC might call for proposals for full scale facilities using the most promising, but currently unproven, technologies. This is considered to entail too many risks and is not recommended.

SWISC might call for proposals on proven technologies only and monitor technological developments elsewhere. These developments would then be selected and implemented when they are proven as suitable for the GTA long-term system. Although there may be advantages to this option, it represents an historical, conservative approach which does not meet the urgency and critical nature of the waste disposal situation in the GTA. A more aggressive program is required to meet the needs of the GTA and the principles of SWISC.

It is suggested that SWISC take an approach which does not entail the risks of proceeding immediately to full scale, unproven facilities but is not as conservative as the historical approach. It would involve:

- fast tracking the most promising diversion technologies through increased co-ordination within the 3Rs Action Plan and the immediate building of demonstration projects in order to test the most appropriate and promising technologies as identified in the report.
- on the above basis, choose and scale-up or build multiple units of the most appropriate technologies for the GTA to have a basically sound long-term system established by 1996
- call RFPs for disposal facilities by the fall of 1990 based on the proven technologies of EFW (including RDF) and/or landfill

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The disadvantages of this approach include:

- the risk of capital investment in demonstration projects which may not meet SWISC's objectives
- the need to identify appropriate sites for the demonstration projects at an early date
- the need for a major organizational effort to prove demonstration projects and select the most appropriate for full scale implementation by 1996

The advantages of this approach include:

- a sound basis for selecting appropriate diversion technologies for GTA conditions and markets
- the demonstration plants would provide firmer cost data and local data on environmental and siting requirements
- additional diversion would be achieved in the short term
- the demonstration plants can be tied to existing and proposed pilot projects throughout the GTA to maximize the benefits gained through increased co-operation. Their initial size would be set to permit immediate establishment under EPA approvals.
- the selection and processing of disposal options which take longer to prepare for EA approvals, could proceed without delay.
- flexibility for a long-term system is maintained.
- maximum participation of all interested parties would be developed.

This approach is recommended as the most appropriate to enable SWISC to meet its objectives.

4.5 Many Promising Technologies Need Testing for Suitability in GTA

The following actions would be required to develop the recommended approach. Should this approach be acceptable to SWISC, these actions would be refined through detailed negotiations with respect to allocation of tasks; sharing of information; funding; and preparation of detailed schedules and budgets.

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1. SWISC would continue to expedite the 3Rs Action Plan to improve overall Reduction and Diversion in the GTA, including the recommended public involvement program and discussions with these respondents who identified actions which could be taken in the short-term.

2. SWISC or its constituent municipalities would issue RFPs for demonstration diversion alternatives to be constructed as soon as possible at a scale sufficient to prove their suitability for a GTA long-term system (and the marketability of end products) and to provide an adequate basis of comparison between alternatives. The specific size and number of MRF and composting facilities to serve the GTA will depend upon the success of existing diversion strategies, the particular needs of each Region, and complex analysis of alternative combinations of waste generation areas, available sites, transportation and economies of scale. Large scale facilities, over 800 TPD in capacity as proposed in the EOIs, may provide a viable alternative to more numerous smaller facilities in meeting diversion targets.

   - Several facilities would be developed. The size of specific facilities would be determined in consultation with the MOE to avoid delays in approval. At present, EPA approval is required for a diversion facility which does not leave a residue for disposal of more than 200 TPD.

   - Siting of facilities could be left to the Proponent, but preferably sites should be chosen by the host Region in consultation with the area municipalities from available, suitable lands. However, initial discussions should be held with Respondents to the EOIs to check if they have suitable sites.

   - The facilities would be designed for maximum flexibility. Most MRF or compost facilities are available in modules with capacity of approximately 50 TPD or greater, so that more than one process could be utilized in a facility. Alternatively space could be left for modification or replacement of a process which did not meet guarantees. The structures required to house the facilities should be designed for conversion to other uses.

   - The implications of scale-up to the large scale capacity alternative are best evaluated by hands-on experience with plants in the order of 200 TPD. Experience at this level

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generally will reveal technological adequacy, cost practicality and labour compatibility.

- There are also economies of scale in building a 200 TPD unit as compared to 50 TPD.

- Competitive financing alternatives appear to be available which could be tied to performance and marketing guarantees.

- The provision of six demonstration plants in the order of 200 TPD or 420,000 TPY represents only 10% of the total waste stream. However they could result in over a 50% increase in the amount of waste currently being diverted.

The information provided in the main technical report will assist in selecting preferred technologies as a basis for the RFPs. The following are examples of the type of demonstration facilities that should be constructed.

- a 200 TPD MRF facility to process mixed Residential wastes remaining after the Blue Box separation at source (Group 1(b))
- a 200 TPD Wet/Dry collection system (Group 1(a)), and MRF facility to process mixed Residential wastes. The design of this facility may also include for the processing of mixed Residential wastes after Blue Box separation at source
- a 200-400 TPD MRF facility to process Commercial and Industrial wastes (based on Groups 1(a) and 1(b))
- at least three, 200 TPD MSW and segregated organic waste composting facilities involving various technologies using the windrow process and combined in-vessel and windrow composting process

Selection of demonstration plants should include consideration of support for these diversion facilities which are tied to specific industrial development (such as EOI #77) which may decide to proceed on their own. The support would be proportional to the benefits received by SWISC.

As described in the report some of these demonstration facilities are already under consideration by the Regions. It is proposed that:

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- Each Region consider which of the demonstration facilities are of greatest interest to them and how they relate to the scale of current pilot programs with a view to adapting them to provide maximum benefit to the GTA as a whole.

- Siting criteria should be established and a review of available sites conducted to determine where the plants may be constructed as soon as possible.
- A cost sharing formula, including funding from the MOE, be developed.

- Each Region be responsible for the preparation of RFPs, construction and operation of its facility(ies) with full sharing of experience with SWISC. SWISC would provide common "proofing" criteria to ensure that all of the information required by SWISC is obtained from each facility.

- SWISC requests that the MOE develop specifications for end products and assist in finding markets for materials.

3. SWISC would convene a meeting of those respondents who proposed systems for handling (a) Commercial and Industrial and (b) Construction and Demolition waste streams, to develop a mutually beneficial approach to expediting diversion facilities and markets. The private sector may respond to these needs which now exist with minimal assistance from and co-ordination from the Regions. Alternatively, SWISC may pursue this directly to ensure that the necessary proven facilities are developed through the issuance of RFPs.

4. SWISC would proceed with the issuance of RFPs in the Fall of 1990 for Disposal facilities which can be implemented by 1996. The facilities should be limited to receiving no more than 50% of the waste generated after the year 2000.

   Both EFW (including RDF) and landfill are proven disposal alternatives. The decision to proceed with EFW and landfill, or landfill only, will depend upon the additional details which would be provided in the Proposals, such as:

   - locations and compliance with the receptive host criterion
   - total landfill capacity available

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- specific site conditions with respect to the total environment criteria
- projected energy requirements
- relationship to other components of the system
- costs

It should be noted that the proposal to construct demonstration plants for diversion technologies within the GTA, should not preclude the alternative to locate full scale diversion facilities outside the GTA for at least part of the GTA total wastes as proposed in some EOIs. Advantages of such an alternative may include the development of secondary industry and availability of markets for compost.

Further consideration should be given to inclusion of refinements in the EFW alternative. This would allow for testing of thermal processes which claim to produce an acceptable lightweight aggregate. The construction of EFW facilities could EFW capacities can be staged to meet requirements depending upon the success of the Diversion program. Landfill life would be extended should the 50% diversion target be exceeded or as a result of additional EFW capacity coming on stream.

The information provided by the EOIs would form the basis for preparation of these RFPs. Specific sites within and outside the GTA would be considered for all disposal options.

5. The Technical Committee would ensure that all information generated from the 3Rs Action Plan, the demonstration plants, and other sources with respect to waste management is available to SWISC so that the long-term plan is state-of-the-art and flexible enough to maintain that condition.

Implicit in that plan would be the determination of additional needs for R&D especially with respect to Disposal alternatives not yet proven, and the definition of the ultimate R&D capability. The type and location of this latter facility, if a new one is required for SWISC, would be determined after selecting the preferred waste management system.

In summary, this approach for the development of a long-term system will provide the basis for achieving maximum Diversion and Reduction of wastes, minimizing Disposal needs, and ensuring that the system is flexible and responsive to new technologies and change over the long-term.

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5.0 NEXT STEPS

The following steps are proposed to continue the development of the long-term waste management system.

5.1 Response to Technical Review of Expressions of Interest

SWISC would consider this report and release it to the participating municipalities, the respondents to the EOIs, and the public for consultation and input as planned.

This should include:

- continued implementation of Part 2 of the Public Involvement and Communications program to the SWISC process, including a series of public meetings in May, 1990
- a meeting with EOI respondents to brief them on the status of the SWISC process in April, 1990
- receipt by SWISC of Regional Council and Public input by the end of June, 1990
- SWISC respond to Regional Councils and the Public in September, 1990

The issues to be addressed during the next few months include:

- the appropriateness of the conclusions and proposals arising from the Technical Review of EOIs report
- the criteria to be used in the RFPs for the siting and selection of disposal facilities including the receptive community criterion
- the extent of export of wastes out of the GTA and these components for which export is most appropriate
- number and size of facilities required
- private-public interface
- the amount and type of materials to be handled by each of the participants (i.e. Municipalities, Regions, SWISC)

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5.2 Commitment to 3Rs Action Plan

SWISC should establish with each of the participating municipalities their commitment to the 3Rs Action Plan and the SWISC and MOE roles in assisting in its implementation.

The issues to be addressed should include:

- **the common portions of the 3Rs Action Plan which would be implemented on a GTA wide basis**
- **those portions of the plan which would be led by specific Regions and degree of participation by others**
- **SWISC's role in supporting the plan**
- **means of funding**
- **allocation of staff and resources**
- **the respective roles of the Public and Private sectors including the relevant Respondents to the EOIs**
- **direction from the Province on specific waste reduction and reuse targets as well as a plan for achieving these targets**

5.3 Improve Definition of Wastes to Be Handled

To provide a common basis for addressing succeeding steps in the development of the waste management system,the Technical Committee should provide:

- **an update of waste generation quantities from each Region**
- **compile all information on the composition of wastes available from recent studies. This information will not be complete and, by the nature of the problem, will change with time. Changes can be accommodated in the terms of RFPs and will avoid the confusion experienced by Respondents to the EOIs in this regard.**
- **advice on the alternatives for control/direction of wastes from the Public and Private sectors**
- **ongoing monitoring of the large quantities of "clean fill" and excavated soils meeting the decommissioning guidelines and used as fill such as presently deposited at the Leslie St. Spit, to ensure that they will not become an additional load on the Regions' waste disposal facilities.**

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5.4 Issue RFPs for Demonstration Plants

Requests for Proposals for demonstration plants should be prepared and issued as soon as possible. This will require further co-ordination with the Regions and the MOE to agree on who will take responsibility for which plants; the determination of suitable sites; the final selection of appropriate technologies; and funding arrangements.

The timing is critical with respect to choosing the preferred diversion alternatives for the EA submission on the total system. The preliminary work should be started immediately, as the investment risked over the next few months would be justifiable even if this approach is subsequently rejected.

The issues to be addressed immediately by SWISC include:

- Regions which will take the lead on various facilities
- number and size of facilities
- funding and sharing of information, including MOE support
- more information on different technologies to select a list of bidders
- siting criteria and selection
- flexibility in design
- collection methods
- scale of modules and total facility
- specifications for end products
- marketability of end products
- approval requirements

5.5 Co-ordinate Research and Development

The Technical Committee should be authorized to ensure that all information required to finalize a long-term waste management system be readily available to SWISC and its member Regions. This committee would be responsible for:

- Co-ordinating the implementation of the 3Rs Action Plan and evaluating results
- Co-ordinating the implementation, evaluation and any modifications required for the demonstration plants.

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- Keeping up-to-date all information obtained on new processes in the waste management field. This would include assembly and analysis of information from the Provincial and Federal Governments; area municipality staff; consultants; and suppliers etc.
- Recommending to SWISC any areas which should be pursued further,including the award of R&D contracts. This could also include those disposal alternatives which were considered to have potential for the GTA.
- Dissemination of information to participating municipalities
- Recommend the timing and specifications for an R&D facility. This facility may be best defined with respect to type and location when the preferred waste management system is selected.

5.6 Issue RFPs for Disposal Facilities

EOIs for disposal facilities are considered to represent alternatives capable of advancing to further evaluation at the full scale RFP stage. In light of the time available to complete technical studies, prepare an environmental assessment and progress through the approvals process, the original target date for issuance of RFPs, September-October 1990, should be maintained if at all possible.

SWISC has adopted the principle of locating all facilities in receptive communities and that a reasonable range of alternative sites can be identified through the use of a receptive community criterion as a primary screen. Any sites meeting that criterion would then be evaluated and compared in a systematic and traceable manner.

In view of the fact that only two receptive communities were identified in the EOIs, it is necessary to meet with respondents proposing disposal facilities as soon as possible to obtain additional information on the status of their sites vis a vis the host communities. The purpose of such meetings would be to ascertain the probability that a reasonable range of alternative sites will be identified through the use of a receptive community screening criteria in the RFP process.

It is also necesary to continue and expand SWISCs efforts to identify receptive communities for respondents currently looking for sites.

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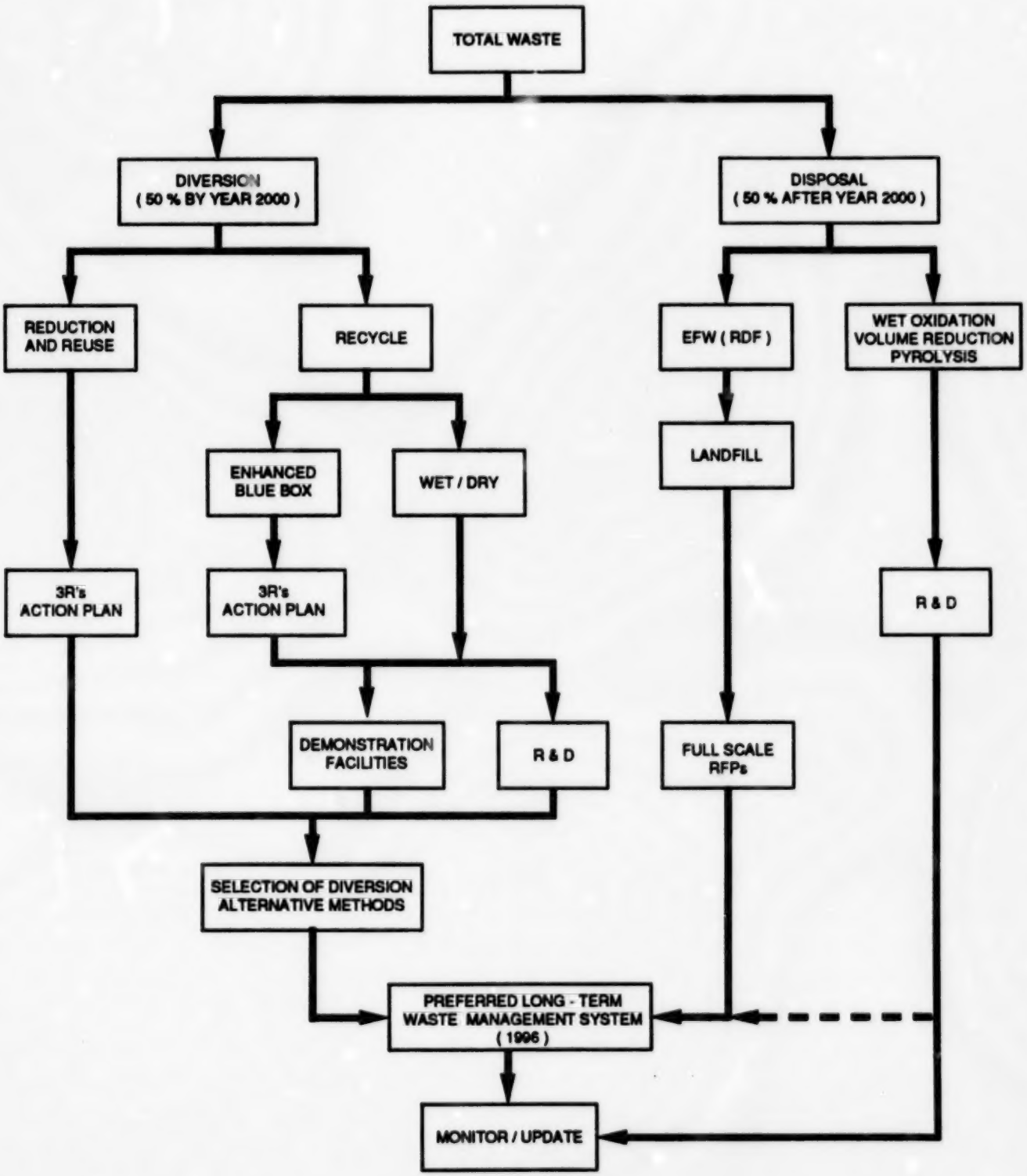
FIGURE 3


TOTAL WASTE
DIVERSION (50 % BY YEAR 2000)
DISPOSAL (50 % AFTER YEAR 2000)
REDUCTION AND REUSE
RECYCLE
EFW (RDF)
WET OXIDATION VOLUME REDUCTION PYROLYSIS
ENHANCED BLUE BOX
WET / DRY
LANDFILL
3R's ACTION PLAN
3R's ACTION PLAN
R & D
DEMONSTRATION FACILITIES
R & D
FULL SCALE RFPs
SELECTION OF DIVERSION ALTERNATIVE METHODS
PREFERRED LONG - TERM WASTE MANAGEMENT SYSTEM (1996)
MONITOR / UPDATE

The issues to be addressed immediately by the Technical Committee include:

- compliance with the EAA, especially the use of a receptive community criterion as a screening mechanism
- the definition of a "receptive community"
- effect on criteria of 50% diversion
- different levels of investigations and information on suitability of sites proposed and how this affects the selection process
- what total capacity and number of facilities should be taken to EA hearing to ensure that enough capacity is approved. Cost implications and who pays?
- ownership and operation
- from the above, prepare a list of respondents who will be asked to submit proposals.

5.7 Conclusion

The proposed approach is summarized on Figure 3. Those EOIs which proposed energy from waste and landfill components will be considered further in the preparation of RFPs for full scale operations. Those which proposed material recovery and composting facilities will be considered further by the Regions who will prepare RFPs for demonstration projects. Those which have been identified as of immediate interest to the 3Rs Action Plan will be contacted by the 3Rs task force. Finally, those which have been referred to R&D will be prioritized by the Technical Committee and decisions made on further liaison with the respondents.

The implementation of the proposals outlined above will provide valuable contributions to the waste crisis currently facing the area and a sound basis for selecting the preferred system to maintain SWISCs objective of providing a long-term waste management system for the GTA by 1996.

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